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## Perceived Role of Early Childhood Nutrition on Academic Performance of Pre-Primary School Children

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By

**SIMEON TERHEMEN PEVER**

*Department of Primary Education,  
College of Education,  
Billiri, Gombe State.*

and

**BARAYA J. MUHAMMAD**

*College of Education,  
Billiri, Gombe State.*

### Abstract

*Nutrition is essential for pre-primary school children because proper nutrition helps prevent illness and affects their growth, development and learning. Eating the right food promotes a better quality of life. This is because when children feel good physically, they are able to take part in the activities they enjoy, they may also perform academically well because adequate nutrition creates a sense of well-being and increases mental clarity. Mal-nutrition during these years impairs children's cognitive development as well as their ability to explore their environments. Effects of malnutrition such as failure to thrive and cognitive impairment may be prevented or reduced with adequate nutritional support. This paper therefore, looked at the meaning of pre-primary school, concept of nutrition, academic performance and the perceived role of early childhood nutrition on academic performance of pre-primary school children. The paper concluded that nutrition is essential for pre-primary school children to achieve their full academic performance, mental growth and lifelong health and wellbeing. It suggested among others that teachers should educate parents, pre-school-aged children to develop healthy eating habit that include proper nutrition by emitting a consistent health message and ensuring that healthy food choices are offered at school and at home.*

**Keywords:** Nutrition, Malnutrition, Pre-primary school, Academic performance, Perceived

In Nigeria, poor academic performance of learners at all levels of educational institution have been prevalent. Some children exhibit behavioural problems such as aggression, phobias, insomnia, low self-esteem and depression which could be as a result of malnutrition or lack of adequate food intake. Poor nutrition due to inadequate diets generally develops in stages. A period of deficient intake of essential nutrients, tissues reserves become depleted, and subsequently blood levels of the nutrient decline (Brown, Isaacs, Krinke, Murtaugh, SharbaughStang and Wooldridge 2005). When the blood levels can no longer supply cells with optimal amounts of nutrients, cell processes change. These changes have a negative effect on cell's ability to form proteins appropriately, regulate energy formation and use, protect itself from oxidation, and carry out other normal functions. Physical signs of deficiency may develop, such as growth failure with protein deficiency or an inability to walk as a result of beriberi (thiamine deficiency)

Pre-primary school age children are between three and five years of age. Characteristics of children at this stage of development includes increasing autonomy, experiencing broader social circumstances such as attending pre-primary school or staying with friends and relatives, increasing language skills; and expanding their ability to control behaviour. Learning to enjoy new foods and developing feeding skills are important components of this period of increasing independence and exploration. Pre-primary school children's exposure to malnutrition might be interfering with their ability to function in school and thus, may lead to decline in their academic performance. The consequences of failure, anxiety and worry that accompany pre-primary pupils from malnutrition may not only determine their low self-concept and esteem but can also deny them imbibing the spirit of hardwork; which is also the hallmark of academic performance. Absence of hardwork equally denies one of having appropriate challenge and learning situations for an individual's perception of his ability and competence. Children have an innate ability to self-regulate food intake. Parents, teachers and caregivers need to provide and guide children nutritious foods and let them decide much to eat.

### **Meaning of Pre-primary Education**

The concept of pre-primary education has been defined variously by different scholars. In the National Policy on Education (NPE), the Federal Republic of Nigeria (FRN, 2014) defined pre-primary (Early Childhood Care) Education as the education given in an educational institution to children prior to their entering the primary school. To Utulu (2005), "Early Childhood Care Education includes all the arrangements providing care and education for children under compulsory school age regardless of

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setting (schools, centres, or carer's home), funding (public or private), hours (part-day, full school day, full work day) or curriculum". Obisanya, Nwokocha, Salawu, Osuji and Sulaiman (2014) viewed early childhood care education as the first formal education children receive under the auspices of the teachers. Its main concern is to building the background of experience that will promote the later attainment of academic skills. Since the rest of the education system is built upon it, any defect or impairment at this stage could go a long way in affecting the later intellectual ability and adjustment of the child. On the contrary, any appropriately planned stimulation of this 'critical' period will greatly influence the child's success in life.

Pre-primary Education therefore means the positive arrangements made by the home and complemented by the school to captivate children to their entering primary school. This level of education therefore serves as a compliment to the home and not a substitute. It helps in preparing the child for his future schooling and also assists him to benefit fully from his present stage of development by equipping him for future living. The starting point of early childhood education for children as outlined in the National Policy on Education by the Federal Republic of Nigeria (2014) is three years. It requires early stimulation of the child for the formation of personality and social behaviour. Children have wonderfully impressionable minds and these minds thus need to be well nurtured and developed from this early stage for future adjustment. The children at this stage have a number of survival needs to contend with in their new environment (School). For instance they need protection from extreme cold or heat which includes good building - classrooms, library, laboratories, furniture, instructional hardware and good playground for physical activities. They need sound nutrition (balanced diet) to enable them to be healthy and resist diseases. Pre-primary school children also need defence mechanism against physical injury, emotion and support-love, care, affection etc. The easiest means of achieving these is by getting them through school interaction hence the need for enriched stimulating environment.

As stated in the NPE (FRN, 2014:12), the purpose of pre-primary education includes, among others:

- i. *Effect a smooth transition from the home to the school;*
- ii. *prepare the child for the primary level of education;*
- iii. *provide adequate care and supervision for the children while their parents are at work (on the farm, in the markets, offices etc);*
- iv. *Inculcate social norms*
- v. *Inculcate in the child the spirit of enquiry and creativity through the exploration of nature, the environment, arts, music and playing with toys etc.*
- vi. *develop a sense of co-operation and team spirit*
- vii. *Learn good habits, especially good health habits and*
- viii. *Teach the rudiments of numbers, letters, colours, shapes, forms, etc.*

### **Concept of Academic Performance**

Academic performance is the ability to study and remember facts and being able to communicate your knowledge verbally or down on paper (Berta, 2007). Parents care about their children's academic performance because they believe good academic results will provide better opportunities for them. Bell (2012) observed that academic performance fulfils a number of purposes; areas of performance and failure in a learner's academic career need to be evaluated in order to foster improvement and make full use of the learning process. Results provide a framework for talking about how learners fare in school, and a constant standard to which all are held. Academic performance is also determined by learners to be ranked and sorted on a scale that is numerically obvious, minimizing complaints by holding teachers and schools accountable for the components of each grade.

At the pre-primary school level, academic performance of children is determined through assessment. Assessing children at the early childhood stage is quite different from assessing older children because they may not be able to read or write at this level. Assessment of children at this level of development is holistic- that is, it cover all areas of development such as cognitive, language, physical and socio-emotional. Descriptive form of reporting children's performance is more developmentally appropriate at this level (Universal Basic Education Commission (UBEC), 2013).

Observation is used by teachersto gather information and evidence about children's academic performance. Teachers can also have conversation with the children, about their learning, help children to identify what they have learnt, gather samples of children's work, and comment on the work as it relates to the curriculum. Teachers can introduce portfolios which are used to collect various samples of children's work. The samples may contain notes from; developmental checklists, parent interviews self portraits, audio or video tapes and anecdotal records as well as samples of scribbling, drawing and writing. Children progresses are recorded and the recorded items must give a clear picture of the child's learning and phases of development. The early learning record for assessment may help to collect reliable evidence and to monitor, assess and report on children's learning.

### **Concept of Nutrition**

The concept of nutrition as viewed by Mallum, Haggai and Ajaegbu (2002) involves the selection, preparation, eating and functioning of food in the body. To Brown, Isaacs, Krinke, Murtaugh, SharbaughStang and Wooldridge(2005), it is the study of foods, their nutrients and other chemical constituents, and the effects of food constituents on health. In this paper therefore, nutrition is seen as the process by which food substances (nutrients) taken by human beings and other living organisms are transformed from one form to another to focus on how diseases, conditions and problems caused by dietary factors such as poor diet (malnutrition) may be prevented

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or lessened with healthy diet. Malnutrition means poor nutrition that result from either inadequate or excessive availability of energy and nutrients. Niacin toxicity, obesity, iron deficiency, and kwashiorkor (protein deficiency in children) are examples of malnutrition. Nutrients are chemical substances in food that the body uses for a variety of functions that support growth, tissues maintenance and repair, and ongoing health.

Macronutrients which provide energy and measured in Kilocalories (Kcal) or joules (1 Kcal = 4185.8 joules) according to MediLexicon (2014) are nutrients needed in relatively large quantities while micronutrients are needed in relatively small quantities. These nutrients consist of carbohydrates, proteins, fats, vitamins, mineral salts and water.

1. Carbohydrates(4 Kcal per gram) are substances in foods that consist of a single sugar molecule or multiples of sugar molecules in various forms. Molecules consist of carbon, hydrogen and oxygen atoms. Sugar, and fruits, starchy vegetables, and whole grain products are good dietary sources.

2. Proteins (4Kcal per gram) are substances in foods that are made up of chains of amino acids. Meat, beans are examples of protein.

3. Fats (Lipids) (9 Kcal per gram) are components of food that characterised by being insoluble in water and account for most of the fat present in human body. They are, however, soluble in non popular organic solvent. Examples of rich sources of dietary fats are oil, butter, and sausage.

4. Vitamins: Vitamins are present in many foods and are essential components of the diet. There are thirteen specific components that perform specific functions in the body. They are called vitamins when our body cannot synthesis (produce) enough or any of it. Vitamins are classified base on what they can do biologically (their biological and chemical) and not their structure. Vitamins are classified as water soluble (they can dissolve in water) or fat soluble (they can dissolve in fat) for human beings, there are four fat-soluble (A, D, E, and K) and nine water-soluble (8 B vitamins and vitamin C) vitamins. These give a total of thirteen vitamins. Good sources of vitamins include vegetables, fruits and grains.

5. Minerals: in the context of nutrition, minerals consist of sixteen (15) elements found in foods that perform particular functions in the body. Medilexicon an online dictionary(2014) noted that the sixteen key minerals are essential for human biochemical processes by serving structural and functional roles, as well as electrolytes. Minerals are often artificial added to some foods to make up for potential dietary shortages and subsequent health problems. Sources of minerals in the body include milk, leafy vegetables, and meat.

6. Water: is an essential component of the diet provided by food and fluid. There are many nutrient required for growth and development of the body. Some of which must be made by the body (non-essential nutrients) while others can be provided by diet (essential nutrients). Most foods contain a combination of some or all of the six nutrient classes. We require some of the nutrients regularly, and others less frequently.

Poor health may be as a result of either not enough or too much of a nutrient, or some nutrients(an imbalance).

### **Essential Nutrients for Pre-primary school Aged Child**

Pre-primary school-aged children grow significantly, but at lower rate, whilst being very physically active in general. As a result, their nutritional needs are critical. Additionally, genetic background, gender, size and shapes are all important determinants of nutrient requirements. The essential nutrients for optimal health of pre-school child as outlined by Vitual Medical Centre (2013) include:

**Energy:** carbohydrate and fats provide energy for growth and physical activities. During periods of rapid growth, appetite increase and children tend to eat constantly. When growth slows, appetites diminish and children eat less at meal times. The brain needs energy to function properly and hence the supply of glucose is relevant and critical. Cognitively demanding tasks, such as schoolwork require regular supplies of glucose to the brain in order to enhance cognitive functioning and improves memory and mood.

**Protein:** Protein builds, maintain and repairs body tissues. It is especially important for growth. It is important that parents encourage children to eat two to three servings of protein daily. Good source of protein for children include meat, fish, poultry, milk and other diary.

**Calcium:** Calcium is important in building strong bones and teeth. Bone density suffers when calcium needs are not met during childhood years. Osteoporosis, a weekened bone disease affects a significant proportion of adults. This begins in childhood if diets are not providing adequate calcium-rich foods. Sources of calcium include milk and dairy products, some dark, green leafy vegetables.

**Iron:** Children need iron because of rapidly expanding blood volume during growth. Meat, fish, poultry and enriched breads and cereals are the best sources of dietary iron.

### **Nutritional Problems in Pre-primary School Children**

Some of the nutritional problems in this age group according to Cezars (2012) include the following:

1. Malnourished children sometimes look sick and very thin. However, there are many others who do not look that way and yet are malnourished because they are not receiving the nutrients they need to grow and develop to their full potentials. To these children Chukwuma (2015) held that, malnutrition over a period of time silently causes poor brain and body development, weakens the immune system, and worsens the impact of common illnesses such as diarrhoea and sometimes death of children.
2. Obesity: this is a nutritional disorder and is a major risk factor for cardiovascular disease in adulthood. Obesity is also implicated in the development of insulin resistance limiting the body's ability to absorb glucose. Eating diets high in fats

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and being less physically active leads to positive energy balance which may be a predisposition to lifelong health problems.

3. **Tooth Decay:** Cavities are caused by over indulging in sugary foods such as soft drinks and confectionery may predispose pre-school aged children to poor dental health. This risk of tooth decay is greatest with the consumption of large amounts of sticky foods that stick to teeth. For example, sweets, candy and sodas.

4. **Anaemia:** Iron-deficiency anaemia may develop in children whose diet is iron-deficient. Iron is an oxygen carrying component of blood. Anaemia in pre-primary school aged children may result in deteriorating effects including poor academic performance due to impaired cognitive development, poor attention rate and general fatigue.

5. **Eating Disorders:** An increasing number of anorexia and bulimia are being more associated with this age group. Some children are being lured by media and other social activities such as watching of televisions, playing games with parents' phone etc. Thereby causing eating disorder which result to malnutrition.

6. **Visually impaired or Blindness:** Pre-primary school children who are visually impaired or blind because of severe vitamin A deficiency may have educational needs that must be met by special education. This could lead to poor academic performance where these special needs are unavailable.

### **Perceived Role of Nutrition on Academic Performance of Pre-Primary School Children**

As children proceed to grow and develop physically, cognitively and emotionally during childhood years in preparation for the physical and emotional changes of adolescence, they also continue to develop eating habits and physical activities that may affect their current and future states of health. At this stage, nutrition plays a significant role in ensuring that children reach their full potentials for growth, development and health. Nutritional problems can still occur during the pre-school age, such as iron deficiency, anaemia and dental caries. Regarding weight, both end of the spectrum are seen during this age. The prevalence of obesity may increase but the beginning of eating disorders can also be detected in some pre-primary school aged children (Story, Holt and Sofka, 2000). Thus, adequate nutrition and the establishment of healthy eating behaviours can help to prevent immediate health problems as well as promote a healthy lifestyle, which in turn may reduce the risk of the child developing a chronic condition, such as obesity, and/or cardiovascular diseases later in life.

Adequate nutrition, especially eating breakfast has been associated with improved academic performance. Children who eat breakfast have better problem-solving abilities, recall, memory, verbal fluency and creativity compare to children who do not eat breakfast, or eat insufficient breakfast that may likely have behavioural, emotional and academic problems at school.

Hookworm infection and schistosomiasis are often a contributory cause of iron-deficiency anaemia. The mechanism for causation in the case of hookworm is parasites feeding on blood in the intestine and spillage, while for schistosomiasis, it is blood loss through either urine or stool. As iron-deficiency anaemia is associated with low IQ and attention deficits, hookworm infection and schistosomiasis should be considered educational risk factors (Pollitte, Watkins and Husaini, 1997).

Elevated blood lead levels in pre-school children are associated with comparatively low IQ, poor performance in tests of information processing and low achievement scores in reading). Among pre-school aged children, adverse effects of elevated blood-lead levels on school learning variable are likely to make worse in those situations where there is inadequate nutrition.

### **Conclusion**

Nutrition is essential for pre-primary school children to achieve their full academic performance, mental growth and lifelong health and wellbeing. When children are not receiving proper nutrition, they are unable to reach their full potentials. In achieving this, the school administrators, teachers, parents and pupils themselves needs to be involved.

### **Suggestions**

This paper suggests the following points for proper nutritious upbringing of the pre-primary school children:

1. Teachers should educate parents, pre-school-aged children to develop healthy eating habit that include proper nutrition by emitting a consistent health message and ensuring that healthy food choices are offered at school and at home.
2. School administrators should provide opportunities for staff to receive education on good nutrition and health in the school environment.
3. Meals should be served to children in a comfortable, friendly atmosphere. This is because environments play a role in pupils eating behaviour, pre-schoolchildren may be more opt to eat a healthy meal if they have enough time to eat and relax with their friends.

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